THE EFFECT OF PROSTATIC INFLAMMATION ON THE OUTCOME OF PATIENTS WITH BENIGN PROSTATIC HYPERPLASIA TREATED BY TRANSURETHRAL RESECTION OF THE PROSTATE

A DISSERTATION

SUBMITTED TO THE TAMIL NADU Dr. M. G. R MEDICAL UNIVERSITY CHENNAI IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR M.Ch. BRANCH – IV (GENITOURINARY SURGERY) EXAMINATION TO BE HELD IN AUGUST 2012

DEPARTMENT OF UROLOGY

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CERTIFICATE

This to certify that the work incorporated in this dissertation entitled **"EFFECT OF PROSTATIC INFLAMMATION ON THE OUTCOME OF PATIENTS WITH BENIGN PROSTATIC HYPERPLASIA TREATED BY TRANSURETHRAL RESECTION OF THE PROSTATE"** is a bona fide work done by **Dr. RAMYA NAGARAJAN** in partial fulfillment of the rules and regulations of M.Ch. Branch IV (Genitourinary Surgery) examination of the Tamil Nadu Dr. M. G. R Medical University Chennai to be held in August 2012.

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ABBREVIATIONS

5-ARI: Five alpha reductase inhibitor

AIP: Asymptomatic inflammatory prostatitis

BPH: Benign prostatic hyperplasia

COAD: Chronic obstructive airway disease

CPPS: Chronic prostatitis/ pelvic pain syndrome

CRF: Chronic renal failure

DRE: Digital rectal examination

IRB: Institutional review board

LUTS: Lower urinary tract symptoms

MI: Myocardial infarction

MS: Meatal stenosis

NIH: National Institute of Health

Pi: Prostatic inflammation

S.D.: Standard deviation

TUR Syndrome: Transurethral resection Syndrome

TURP: Transurethral resection of the prostate

US: Urethral stricture

UTI: Urinary tract infection

Group A= Absence of prostatic inflammation (Pi-)

Group B= Presence of inflammation (Pi+)

ABSTRACT

AIM:

To evaluate the role of asymptomatic prostatitis found in biopsy specimens on the outcome of patients undergoing a TURP for BPH.

PATIENTS AND METHODS:

All patients who had undergone a TURP between 2005 and 2010 in our institute for BPH and who had a minimum of 3 months follow-up were included. The study population was divided into two cohorts: those with, and those without prostatic inflammation. The outcomes between these two groups were compared with respect to predefined parameters, including demographic data, indication for TURP, positive preoperative urine cultures, presence of a urinary catheter, duration of follow-up, weight of gland resected, monopolar / bipolar resection, need for blood transfusion, emergency re-explorations, TUR syndrome, clot retention, recatheterisation; Long term complications like meatal stenosis, urethral stricture, bladder neck contracture, and recurrent adenoma were also noted. The modified Clavien system for TURP was used for reporting complications.

RESULTS:

There was no significant difference between both the groups both with respect to long-term and short term complications.

CONCLUSIONS:

Prostatic inflammation may be a co-incidental finding in the biopsy of patients undergoing a TURP. The association between both short term and term complications and the presence of prostatitis could not be demonstrated in our study. Larger prospective trials may be needed to further validate these findings.

INTRODUCTION

The co-existence of inflammation and BPH in the prostate is well-known, although the significance of histologically proven prostatic inflammation and its relationship with BPH is not well-understood[1]. While prostatic inflammation may play a role as an inciting even in the development of BPH nodules, its role as the next link in the chain of events after treatment has not been elucidated[2]. Asymptomatic prostatitis (Category IV of the NIH Classification of Prostatitis)[3] is a well-recognised entity noted in TURP biopsy specimens. Pathological consensus dictates that chronic inflammation must typically involve the prostate in a peri-glandular distribution, to be considered prostatitis. Diffuse stromal infiltrates or focal lymphoid aggregates in the stroma may be seen ubiquitously, and are considered to be of no clinical significance[4]. Few studies exist on the influence of this chronic prostatitis seen after TURP on patient outcomes after the procedure. Bucuras et al compared two groups with and without chronic prostatitis in the TURP biopsy specimens and found no significant difference in intra-operative and post-operative complications between them[5]. A study by Doluoglu, however found prostatic inflammation to be a significant factor for the development of urethral stricture and bladder neck contractures after TURP[6]. Our study was conducted to look into this controversial issue and see if an association truly exists.

REVIEW OF LITERATURE

The human prostate is an immunocompetent organ, harbouring a smattering of inflammatory cells that populate the stroma and the epithelium. As age increases, the number of T&B lymphocytes, macrophages and mast cells within the prostate also increases. Chronic inflammation of the prostate has a characteristic histological signature, consisting mainly of CD3+ and CD4+ T lymphocytes (70-80%), CD19 or CD20 B lymphocytes (10-15%) and macrophages (15%).

Prostatic inflammation is a nebulous term, with no clear-cut definition as to what constitutes it, histologically. A clinical definition of what encompasses prostatitis is partly laid down in the chronic pelvic pain / CPPS syndrome classification system. Molecular studies have only now enabled the identification of the types of inflammatory cells that populate the prostate, leading to some clarity. The earliest attempt to arrive at an accepted histological classification of prostatitis was made by Kohnen at al in 1978. They described 6 morphologically distinct patterns (Figs. 1 & 2) of prostatic inflammation based on analysis of prostatectomy specimens –

(i) Segregated glandular inflammation,

(ii) Peri-glandular inflammation

(iii) Diffuse stromal inflammation,

(iv) Isolated stromal lymphoid nodule

(v) Acute necrotizing inflammation

(vi) Localized granulomatous inflammation.

Irrespective of the presence of disease, chronic prostatitis is most commonly characterized by a lymphocytic infiltrate in the stroma immediately adjacent to the prostatic acini, a finding re-established by Nickel et al[6]. Stromal infiltrates often co-exist with peri-glandular peri-glandular inflammation, but their presence can be ubiquitous[8].

Inflammatory cell infiltrates had been noted in the prostatic tissue of patients with BPH in Kohnen's study, and there have been many studies which reveal that these two entities often co-exist[8]. The clinical relevance of this association, however, remains a mystery.

Evidence exists for chronic inflammation as an etiological agent in many human cancers like stomach, large bowel and liver. The temptation to draw a parallel for development of neoplasia in chronically inflamed prostates held immense appeal for many investigators, and a link between prostatitis and prostate cancer was sought[10].

Prostatic inflammation was found in more than 2/3rds of men in the REDUCE trial. Prostatic tissue in BPH was found to have chronic inflammation in ~43% of specimens, as reported by Di Silverio[8]. Areas of chronic inflammation frequently occur in radical prostatectomy specimens, prostatic biopsies, and autopsy material[9,10]. The link between the presence of inflammation, BPH has also been explored, with Nickel even questioning if it is the missing 'third' link in the pathophysiology of hyperplasia along with its static and dynamic components[11].

There thus exists a dichotomy in the world of prostatitis, with pathologists defining it as an increase in the prostatic parenchyma while the urologist's view is a clinical one. The classical definition for the urologist has been a syndrome characterized by lower genitourinary tract pain/discomfort and inflammatory cells seen in the expressed prostatic secretions. These syndromes were together incorporated into a single classification of the chronic prostatitis/pelvic pain syndromes (CPPS) by the NIH group[3].

The NIH consensus classification of prostatitis syndromes includes 4 categories:

I	Acute bacterial prostatitis
II	Chronic bacterial prostatitis
III	Chronic prostatitis/chronic pelvic pain syndrome A. Inflammatory B. Non-inflammatory
IV	Asymptomatic inflammatory prostatitis

Category IV of the NIH classification comprises prostatitis detected incidentally on biopsy, and is called asymptomatic prostatitis. Therapy is not deemed necessary for this group, as these patients are by definition asymptomatic. The incidence of asymptomatic prostatitis has been found to be 43-98% in surgically resected prostates for BPH[11] .

The clinical significance of finding asymptomatic prostatitis in TURP specimens has not been clearly elucidated. BPH is the most common disease affecting old men with an estimated 70% incidence at 60-70 years, with increasing incidence and prevalence with age[12]. As the

incidence increases, an increasing number of patients will eventually require surgery as an end-point of disease progression.

TURP remains the gold standard treatment for surgical management of BPH. The likelihood that a person will require TURP increases by 6, 14 and 8 times with each completed decade after 59 years. After its introduction in the early 20th century, the morbidity and mortality associated with TURP has steadily fallen with progressively increasing instrumental and technical advancements.[13] The risk of intra-operative complications like cardiac events and TUR syndrome is small but real.[14] The advent of bipolar TURP technology arose from the need to overcome the peri-operative and post-operative morbidity of conventional monopolar TURP.

Meatal stenosis and strictures of the urethra are major late complications after TURP. The former usually occur due to discrepancy in size between the resectoscope sheath and the meatal diameter [15]. Urethral strictures, on the other hand are proposed to be caused by mechanical and thermal stress to the urethra, along with inappropriate lubrication, incorrect axial and rotating movements of the resectoscope, longer periods of operative time, and with prolonger catheterization times[16]. The incidence of meatal stenosis /urethral strictures and bladder neck contractures in contemporary series is reportedly to the tune of 2.2-9.8% and 0.3-9.2% respectively[14].

With regards to bladder neck contractures after TURP, it has been suggested that performing a bladder neck incision after TURP in patients with small prostates may be beneficial[18, 19].

The role of chronic inflammation seen after TURP in influencing outcomes after TURP has not been extensively evaluated. Bucuras et al retrospectively analysed 200 consecutive cases of BPH with no history of chronic prostatitis. Two groups were identified from these depending on whether the prostatic tissue harboured inflammation or not. There were no significant differences concerning intra-operative and postoperative complications between the two groups, barring acute urinary retention, which was more frequently seen both before and after surgery in patients with prostatitis. The authors concluded that further studies were needed to elucidate this problem more clearly.[20]

A similar study by Doluoglu et al was conducted to evaluate the relationship between pathologically proven prostatic inflammation and re operation rates due to stricture urethra and bladder neck stenosis occurring after TURP. Retrospective data on 917 patients was reviewed with respect to the presence or absence of inflammation in the biopsy specimen after TURP. These two groups were compared with respect to the descriptive data and need for re-operation. It was found that the re operation rate in the group with prostatic inflammation was significantly higher than that without chronic prostatitis (29.8% vs.

8.6%, p=<0.0001). It was proposed that prostatic inflammation seen on TURP histopathology was an independent variable affecting the development of urethral stricture or bladder neck contracture.[21]

While considering the complications and pre-operative risk factors the use of pre-operative anticoagulant use, anti platelet use, pre-operative catheter placement, larger prostate size, use of monopolar /bipolar cautery etc. have all also been demonstrated to have an impact on outcome.[22]

With increasing need for a standardized method of reporting classification, the Clavien system was introduced in 1992, and later modified in 2004.[23] This modified Clavien- Dindo system was introduced across all surgical disciplines, including urology, improving the detection of often un-reported and minor complications. Improved detection thus culminated in less observation bias, especially in retrospective studies. Mamoulakis et al suggested the use of this system to allow for an objective, standardized and detailed comparison of reporting complications of TURP.[24] The majority in their series were those with Grade 1 or Grade 2, with one death (Grade 5).

Grade	Subgrade	Original Clavien definition	Modified Clavien for TURP
I		**Nonlife-threatening with no residual disability**	
		Any deviation from the normal postoperative course without the need for endoscopic, radiological or surgical intervention.	Haematuria clot retention requiring bladder irrigation/ clot evacuation/catheter traction
			Catheter block due to retained TUR chip
		Pharmacological therapy including antiemetics, antipyretics, analgesics, diuretics, electrolytes and physiotherapy.	Failed trial without catheter with acute urinary retention requiring bedside recatheterization
		Wound infections opened at the bedside	Transient elevation of serum creatinine
			Lower urinary tract infection requiring antibiotics
II		**Potentially life-threatening complications not requiring invasive procedures, with no residual disability**	
		Complications requiring pharmacological treatment with drugs other than allowed for grade I also including blood transfusions and total parenteral nutrition	Haemorrhage/haematuria requiring transfusion
			Urinary tract infection with bacteraemia requiring antibiotics
			Supra-ventricular tachycardia requiring anti-arrhythmic drugs
			Pulmonary embolism requiring anticoagulants
III		**Complications requiring endoscopic, radiological or surgical intervention**	
	a	Intervention not under general anaesthesia	
	b	Intervention under general anaesthesia	Extraperitoneal fluid collection due to sub-trigonal catheter requiring endoscopic catheter reposition and surgical drainage
IV		**Life-threatening complications requiring ICU management**	
	a	Single organ dysfunction	Acute myocardial infarction requiring admission to ICU
	b	Multi-organ dysfunction	TUR syndrome requiring admission to ICU
V		**Death**	Death

TURP, transurethral resection of the prostate.

AIM

1. To study the outcome variables between two patient cohorts with the absence or presence of inflammation identified histologically in their TURP specimens.
2. To determine the role of asymptomatic prostatitis in the development of short term and long term complications after a TURP

PATIENTS AND METHODS

DESIGN AND LOCATION:

This hospital based historical cohort study was conducted at the Department of Urology, Christian Medical College, Vellore.

PATIENTS:

All patients who underwent a TURP in our hospital between 2005 and 2010 who satisfied the following inclusion and exclusion criteria were recruited:

INCLUSION CRITERIA:

1. Patients with a minimum follow-up of 3 months.
2. Patients whose biopsy showed BPH with/without glandular/peri-glandular stromal inflammatory infiltrates suggestive of prostatitis.
3. Absence of chronic perineal/pelvic pain (i.e. patients classified to have Asymptomatic inflammatory Prostatitis - Category IV of the NIH Classification of Prostatitis)

EXCLUSION CRITERIA:

1. Patients undergoing TURP with a concomitant procedure (for eg.hernioplasty/circumcision/cystolitholapaxy).
2. Patients who had a histological diagnosis of carcinoma prostate.

3. Prior history of urethral instrumentation.
4. Biopsy patterns showing scattered/focal stromal inflammatory infiltrate without any acinar/peri-glandular involvement.

DURATION:

Patients operated at our institution between January 2005 and December 2010 were included.

METHODOLOGY:

Patients who underwent a TURP at our institute during the aforementioned study period and fulfilling the inclusion criteria detailed above were selected for inclusion in the study. Prior to surgery, all patients were subjected to a thorough history-taking & physical examination. IPSS, serum biochemistries, urine analysis, and urine cultures were documented. Serum PSA was not sent routinely. Patients on anti platelet therapy were asked to discontinue the drug for a period of a week pre-operatively. A detailed proforma was filled up for each patient recording the data to be assessed. Informed consent was taken in the appropriate format. In accordance with institutional policy an IRB committee clearance was obtained for the study. The TUR-P was performed using the same technique in all cases with the use of a 26F continuous irrigation resectoscope and with either a bipolar or monopolar energy source. A BNI was added to at the end of the TURP

in those noted to have a small gland intra operatively. Patients with a biopsy showing presence/absence of inflammation who had a minimum of 3 months follow-up were included (150 in each cohort) and analysed. Re-interventions for complications were performed in the event that the patient presented at a later date with a poor flow, with uroflowmetry showing an average Q max of less than 10 ml/second.

DETAILED METHODOLOGY:

FOLLOW-UP:

Only those patients having a minimum follow-up of 3 months after the TURP were included, as the mean time reported for complications like bladder neck contracture is reported as 2 months[17].

INDICATION FOR TURP

These were classified as chronic retention, acute retention, acute on chronic retention, failure of medical management, obstructive nephropathy, recurrent urinary tract infections (UTIs), recurrent hematuria or highly bothersome LUTS. If more than one indication existed, the single most significant one was taken for consideration.

USE OF PRE-OPERATIVE 5 –ALPHA REDUCTASE INHIBITORS

Prior use of any of the 5-Alpha reductase inhibitors (Finasteride or Dutasteride) either alone or in combination with alpha-blockers was noted. This was included due to the known effect of reduction in prostate gland volume associated with this class of drugs, which in turn could have an effect on outcomes after TURP.

PRE-OPERATIVE URINARY CATHETER

Presence or absence of a pre-operative urinary catheter was noted.

CO-MORBIDITIES

The associated patient risk factors which could affect peri-operative mortality/morbidity like diabetes mellitus, hypertension, ischaemic heart disease, chronic obstructive pulmonary disease, anticoagulant use, anti platelet use and chronic renal failure were noted. The patients were then grouped into those who had single, multiple, or no co morbidities in the final analysis.

DIGITAL RECTAL EXAMINATION

Pre-operative DRE assessment of the gland size was recorded.

I

IMMEDIATE POST-OPERATIVE COMPLICATION

To ensure for uniformity in reporting complications, the modified Clavien system for TURP proposed by Mamoulakis et al. was used.[24] The complications were graded from Clavien grade 1 through grade 5.

LONG TERM COMPLICATIONS

The occurrence of meatal stenosis, urethral stricture, bladder neck contracture or recurrent adenoma was noted on follow-up. All these patients underwent re interventions for the complication (viz. Meatal dilatation/meatoplasty/endoscopic internal urethrotomy EIU /urethral Teflon dilatation or bladder neck incision).

RESECTED GLAND

The actual weight of the resected prostatic tissue (in grams) was recorded.

PRESENCE OF PROSTATITIS

The presence of inflammatory infiltrate in a location characteristic for prostatitis (viz. periglandular stroma, glandular epithelium and intraglandular luminal sites) was identified based on the biopsy report and patients with/without prostatic inflammation and adequate follow-up were included, to attain the sample size of 300. Presence of scattered or focal stromal inflammatory infiltrates *alone* was not included.

PRE-OPERATIVE URINE CULTURE

This was obtained as a suprapubic aspirate/ mid-stream clean catch or catheter sample. Patients with significant pre-operative urine cultures were treated for a minimum of 3 days with a course of culture-specific antibiotics. Colony counts of >100,000 c.f.u was considered significant.

POST-OPERATIVE URINE CULTURE

This was obtained after the TURP procedure either as a voided sample or a catheter sample in those who had failed bedside TWOC post-operatively. Patients with significant post-operative urine cultures were treated for a minimum of 3 days with a course of culture-specific antibiotics. Colony counts of >100,000 c.f.u were considered significant.

STATISTICAL ANALYSIS:

Sample size calculation: Based on previous studies in contemporary literature[14,17] the expected mean difference in complications between those with (10%) and without (2%) prostatic inflammation was kept at 6%. The number needed to detect a significant difference, keeping the power at 80%, was calculated to be a minimum of 140 in each arm. We finally included 300 subjects (150 in each group) in the study.

Statistical package for social science (SPSS) version 16.0 was used for statistical analysis.

The results were grouped into two groups: Group A included patients with a pattern of prostatic inflammation seen in the biopsy specimen after TURP and Group B included patients in whom there was none. .

Student's T-test was used to compare quantitative variables between the groups and the Pearson's Chi-squared test was used to analyse association with complications qualitatively. Mean ± standard deviations were used for normally distributed data and median & range (min – max) was used for skewed data to avoid the outlier effect. The Mann-Whitney U test was used to assess variables not following a normal distribution. A p value of ≤ 0.05 was taken as significant.

RESULTS

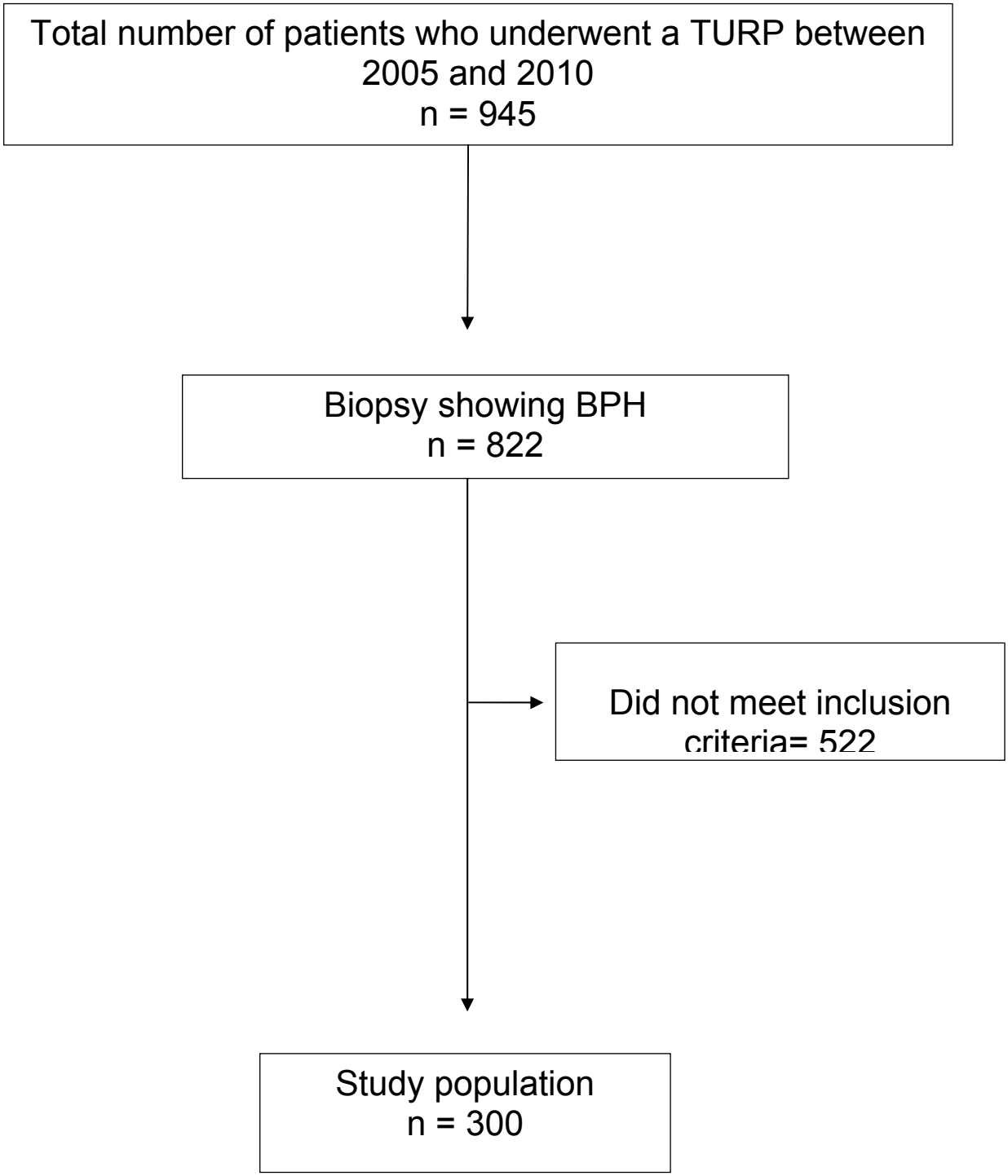
Total number of patients who underwent a TURP between 2005 and 2010
n = 945
Biopsy showing BPH
n = 822
Did not meet inclusion criteria= 522
Study population
n = 300

TABLE 1

Variable	**Group A (Pi-) Mean±S.D.**	**Group B (Pi+) Mean±S.D.**	**p value**
Age (years)	63.79±8.04	64.41+7.76	0.49
DRE gland size (grams)	31.83±10.5	31.92±9.93	0.90
Resected weight (grams)	20.9±18.15	23.2±14.95	0.16
Hospital stay (days)	6.21±2.57	6.17±2.21	0.38
Follow-up (months)	24.9±21.07	20.9±18.15	0.12

TABLE 2

Comorbidities	**Group A (Pi-) %**	**Group B (Pi+) %**	**p value**
None	44%	32%	1.08
Single	32%	48%	
Multiple	24%	20%	

TABLE 3

Preoperative ARI use	**Group A (Pi-) %**	**Group B (Pi+) %**	**p value**
Used	20%	14%	1.94
Not used	80%	86%	

TABLE 4

Preoperative catheter	**Group A (Pi-) %**	**Group B (Pi+) %**	**p value**
Absent	54%	53%	0.45
Present	46%	47%	

TABLE 5

Indication	Group A (Pi-) %	Group B (Pi+) %	p value
Chronic retention	9.4%	11.3%	0.4
Acute retention	18.8%	21.3%	
Acute on chronic retention	17.4%	15.3%	
Failure of medical management	43%	32%	
Obstructive nephropathy	0%	0.7%	
Recurrent UTI	2%	3.3%	
Recurrent hematuria	1.3%	2.7%	
Bothersome LUTS	8.1%	13%	

TABLE 6

Energy source	Group A (Pi-) %	Group B (Pi+) %	p value
Monopolar	91.3%	91.3%	0.58
Bipolar	8.7%	8.7%	

TABLE 7

Blood transfusion intra-operatively	Group A (Pi-) %	Group B (Pi+) %	p value
Given	96%	4%	1.08
Not given	93%	7%	

TABLE 8

Surgery performed	Group A (Pi-) %	Group B (Pi+) %	p value
TURP	95.3%	94%	0.39
TURP + BNI	4.7%	6%	

TABLE 9

Clavien Grade 1 Complications	**Group A (Pi-) %**	**Group B (Pi+) %**	**p value**
None	81%	70.7%	0.06
Hematuria	1.4%	3.3%	
Clot retention	2%	1.3%	
Blocked catheter	0%	0.7%	
Bedside failed TWOC	2%	2.7%	
Transient rise of creatinine	2%	0%	
Post-operative UTI requiring antibiotics	10.8%	21.3%	

TABLE 10

Clavien Grade 2 Complication	**Group A (Pi-) %**	**Group B (Pi+) %**	**p value**
None	95.3%	97.3%	0.39
Hemorrhage requiring blood transfusion	2.7%	1.3%	
UTI with septicemia	0.7%	1.3%	
Supraventricular tachycardia	1.3%	0%	
Pulmonary embolism	0%	0%	

TABLE 11

Clavien Grade 3 Complication	**Group A (Pi-) %**	**Group B (Pi+) %**	**p value**
No re-exploration	97%	98.7%	0.248
Re-exploration with anesthesia	3%	1.3%	

TABLE 12

Clavien Grade 4 Complication	**Group A (Pi-) %**	**Group B (Pi+) %**	**p value**
TUR Syndrome	4%	1.3%	0.14
MI	0%	0%	

TABLE 13

Long term complications	**Group A (Pi-) %**	**Group B (Pi+) %**	**p value**
Meatal stenosis	2%	3.3%	0.51
Stricture urethra	6%%	6.7%	0.64
Bladder neck contracture	3.3%	5.3%	0.72
Recurrent adenoma	2%	3.3%	0.51

TABLE 14

OVERALL INCIDENCE OF LONG TERM COMPLICATIONS

LONG TERM COMPLICATION	Total n= 300(%)
Meatal stenosis	7(2.3%)
Urethral stricture	18(6%)
Bladder neck contracture	11(4.3%)
Recurrent adenoma	8(2.6%)

RESULTS

The two groups of patients were divided based on the absence or presence of prostatitis.

GROUPA	GROUPB
Prostatitis absent (Pi-)	Prostatitis present (Pi+)

PATIENT PROFILE

The study group comprising 300 patients had an overall mean age of 64 years (range 47-88). All the patients had an average hospital stay of 6 days, including the dates of admission and discharge. The mean gland size of the group was 32 grams and the mean resected weight was 22 grams. We had kept a minimum follow-up criterion as 3 months, and the mean follow-up duration noted in our study was 22 months. The longest duration of follow-up among all the groups was 72 months.

The baseline demographic data compared between Group A and B revealed a similar distribution of age, gland size on DRE, hospital stay, and follow- up, suggesting both the groups were homogeneous in composition.

The comorbidities between the groups showed a similar pattern. There was a slightly higher incidence of patients with multiple co-morbidities in Group A (24%). Group B showed a higher incidence of patients with a single co-morbidity, the most common of which was hypertension. Overall the most common co-morbidity among our patients was hypertension, followed closely by diabetes mellitus. COAD, ischemic heart disease, chronic kidney disease and anti-platelet use were the other co-morbidities noted
in the study group, but these were not analysed individually.

A small proportion of our patients had been on Alpha-reductase inhibitors preoperatively. This was uniform in both the groups- 14% and 20% in group A and B respectively. The remainder either did not report use of this drug or had not been started on it. The difference between use in group A and B was not significant
(p= 1.94).
Around 50% of the patients in both group A and group B were on catheters preoperatively , showing that both groups has a similar patient profile, preventing potential skewing of data.

The most common indication between for both groups was failed medical management, which was slightly more common in group A (43% vs. 32%). This was not however a significant difference. The

other indications in decreasing order of importance were acute retention, chronic retention, acute on chronic retention, recurrent hematuria and recurrent hematuria. There were no cases of obstructive nephropathy in group A, but this was again not of significant on comparison between the two groups.

The use of monopolar and bipolar current as energy sources showed remarkable similarity between the two groups. Monopolar cautery was the predominant source of energy used, with the use of bipolar was approximately 9% in both the groups.

The intra-operative use of blood products between the two groups also was similar , with an overall average transfusion rate of ~5%. The transfusion given post-operatively due to hematuria in the ward was recorded separately using the Clavien classification (vide infra).

The surgery performed in most cases was a TURP , which had a similar incidence in groups A and B. The addition of a BNI failed to make a difference in outcome between the two groups. The overall incidence of concomitant BNI performed in our series was 5%.

On analysis of the short term complications as recorded by the Clavien system , it was noted that the most common Clavien complication was

the post-operative use of antibiotics for UTIs. These were either symptomatic or asymptomatic with significant colony counts, which were treated with a course of antibiotics. Though a seemingly higher incidence of post-operative UTIs was seen in group B , this difference was not statistically significant. The next most common Clavien 1 complication was hematuria noted in the post-operative period, which required irrigation and removing the catheter a few days later , as and when the catheter effluent was clear. The incidence in the two groups of bedside failed TWOC was 2% and 3% in the groups. These patients were recatheterised and had a successful trial void at a later date on an OPD basis. There was a small 2% incidence of transient creatinine rise in group A, which again was not significant. Overall the two groups showed no significant difference in Clavien 1 complications.

Clavien grade 2 complications were again rare, with the most common one being hematuria requiring blood transfusion in the post-operative period. This incidence in our series was 2.7% in group A and 1.3% in group B, with the mean overall postoperative transfusion rate being 1.5%. A small percent of both the groups progressed to have UTI with septicemia, requiring a two-week course of antibiotics, This was seen with a similar incidence in both the groups, and the the presence of inflammation in the biopsy did not have any statistically significant association with the occurrence of this morbidity. 2 patients developed

ECG changes intra operatively, requiring a shift to SICU in the immediate post-operative period, These were not associated with any cardiac enzyme elevations and they subsequently had no complications. There was no incidence of pulmonary embolism in both the groups. The overall p value between the two Clavien grade 2 groups was 0.9, suggesting no statistically significant difference.

In the post-operative period 3% of patients in Group A required re-exploration for clot evacuation subsequent to postoperative bleeding . The corresponding incidence in group B was 1,3%, showing that there was no difference in Clavien grade 3 complication rates.

Group A was noted to have a 4% incidence in postoperative TUR syndrome, though no obvious cause was evident for this. On statistical analysis failed to highlight a possible association prostatitis and the occurrence of TUR syndrome. None of the patients had an MI in either of the groups.

There were no Clavien grade 5 complications reported in either of the groups, making a comparison impossible.

Finally, analysis of the long term complications between both group A and group B (with respect to meatal stenosis, urethral stricture formation, bladder neck contracture or recurrent adenoma) also showed no statistical significance.

DISCUSSION

The significance of finding chronic prostatitis in the biopsy specimens of patients undergoing a TURP has been debated.

While some authors reported an association with outcomes, other researchers failed to demonstrate a definite link of association between this pathological entity and clinical outcomes after TURP.

The study was initiated to address the role of asymptomatic prostatitis found incidentally on TURP specimens and to look for an association with either long term or short term outcomes. Our baseline demographic data showed that both the groups (Group A and Group B) had a similar clinical profile , suggesting that both the study populations were homogeneous. The placement of pre-operative catheter, 5ARI use, presence of single versus multiple comorbidities , pre-operative positive urine cultures , gland size, energy source used (monopolar or bipolar) or resected glandular tissue weight did show any statistical significance between the two groups. The immediate short term complications were stratified into 5 Clavien Grades , and these also failed to show any association with the presence or absence of asymptomatic prostatitis. Finally , the occurrence of long term complications (which have been hypothesized to be the sequelae of chronic inflammation and irritation) was found to be the same across both the groups, putting the hypothesis of inflammation as a cause for

long term complications into question. The overall incidence of both long term complication in our case series(2.3%, 6%, 4.3% and 2.6 % for meatal stenosis , urethral stricture, bladder neck contracture and recurrent adenoma respectively) is comparable with that found in contemporary series on TURP complication rates[14.]

CONCLUSIONS

1. Presence of prostatitis on histopathology did not alter the outcome of patients who underwent a TURP.
2. Short term and long term complications of TURP had no association with the finding of prostatitis in the biopsy. Asymptomatic prostatitis was merely a co-incidental finding in the biopsy of patients undergoing a TURP.

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PROFORMA

1. Name:
2. Age:
3. Hospital number:
4. Address:
5. Phone number:
6. Hospital stay(days):
7. Follow-up duration (months):
8. Pre-operative positive urine culture: Y/N
9. Pre-operative antibiotics course:Y/N
10. Indication for TURP: Chronic retention/ acute retention/ acute on chronic retention/ failed medical management/ poor flow/ recurrent UTI/ recurrent hematuria/ bothersome LUTS
11. Co morbidities: Absent/single/multiple {Specific details: }
12. Pre-operative urinary catheter: Y/N
13. DRE gland size (grams):
14. Energy source: Monopolar/bipolar diathermy
15. Blood transfusion: Y/N
16. Gland resected (grams):
17. Biopsy showing chronic prostatitis: Y/N
18. Post-operative positive urine culture: Y/N
19. Post-operative complications: Y/N
20. Clavien grade of complication: 1/2/3/4/5 {Specific details: }
21. Long- term complications: Meatal stenosis/urethral stricture/bladder neck contracture/residual prostate